

REMARKS

Claims 1-31 are pending in the application.

Claims 1-31 stand rejected.

Claim 6 has been amended to correct a grammatical error.

Rejection of Claims under 35 U.S.C. § 101

Claim 12 stands rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. The claim is directed to instructions on a computer-readable medium and the Office Action states that the term “signals” has multiple definitions and can include sound, image, or message transmitted or received in telegraphy, telephony, radio, television, or radar. Apparently, the Examiner is seeking a definition in the specification to define “signals” as a *tangible* medium. Applicants respectfully request that the Examiner explain how this “tangibility” requirement arises under § 101, and/or provide the Applicants with some reference to statute, rules, or the MPEP describing the same. Further, even if such requirement can be shown, Applicants respectfully traverse this rejection for the following reasons.

Applicants note that claim 12 is directed to instructions on a computer-readable medium. As noted in the Examination Guidelines for Computer-Related Inventions, “[w]hen functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases.” MPEP 2106, page 2100-12. Furthermore, “[c]laims that recite nothing but the physical characteristics of a form of energy, such as frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena . . . . However, a signal claim directed to a practical application of electromagnetic energy is statutory regardless of its

transitory nature.” MPEP 2106(IV)(B)(1)(c) (emphasis added). Claim 12 is clearly directed to more than simply the physical characteristics of a form of energy. The claim requires that the signals carry the claimed instructions on a communications medium that must be sufficiently tangible because it is, by the terms of the claim, a computer readable medium.

Thus, for at least the above reasons, Applicants urge the Examiner to withdraw the 35 U.S.C. § 101 rejection of claim 12.

*Rejection of Claims under 35 U.S.C. § 102*

Claims 1-31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Frank, et al., U.S. Patent No. 6,532,494 (Frank). Applicants respectfully traverse this rejection for the following reasons.

Independent claim 1 recites a method for:

providing a coordinator virtual device corresponding to at least a portion of a physical data storage device;  
detecting when a computer system cluster, including a plurality of nodes, is partitioned;  
attempting to gain control of the coordinator virtual device; and  
removing at least one of the plurality of nodes from the computer system cluster when the attempting is unsuccessful.

The Office Action states that the claimed “providing a coordinator virtual device” is taught at different portions of Frank, i.e., in the abstract, at col. 1, lines 30-40, and at col. 3, lines 34-45. The abstract describes “quorumless network cluster” operations and does not address a coordinator virtual device at all. Moreover, the Examiner fails to identify anything described in the abstract as corresponding to the claimed coordinator virtual device.

Frank, col. 1 lines 30-40 states the following:

As is known in the art, a computer network cluster is a collection of interconnected computers which share resources such as data storage. The individual computers, or nodes, are connected through both a physical and a software-level interconnect. The independent nodes are integrated into a *single virtual computer*, appearing to an end user as a single computing resource. If one node fails, the remaining nodes will handle the load previously handled by the failed node. This multiple computer environment provides many benefits to a user including high availability and increased speed of operation.

(emphasis added)

This paragraph describes a network cluster, but says nothing about a coordinator virtual device as recited in Applicants' claim 1. The network cluster of the paragraph simply describes independent nodes of a cluster are integrated into a single virtual computer and appear to an end user as a single computing resource. The Applicants respectfully submit that Frank's cluster as a whole neither teaches nor suggests Applicants' claimed "coordinator virtual device." Applicants' claimed coordinator virtual device, on the other hand, is not a cluster. The coordinator virtual device is used to assist in removing one of the nodes from a cluster when the cluster is partitioned and is clearly not the cluster itself.

Frank, col. 3, lines 34-45, states the following:

Here, shareable storage 22 has been illustrated as a single storage disk or the like. It should be understood by one of ordinary skill in the art that the shareable storage may include multiple storage devices. To implement multiple storage devices as the shareable storage 22, a header 25 of each storage device may include data indicating the identity of all devices comprising the shareable storage 22, a version number for information contained in the header 25, and any other pertinent data. To gain membership in the quorumless cluster 10, a node must have access to all storage devices comprising the shareable storage 22.

This paragraph has nothing to do with a device performing the functions of the claimed coordinator virtual device, much less disclosing providing a coordinator virtual device corresponding to at least a portion of a physical data storage device as required by Applicants' claim 1.

Regarding the claimed attempting to gain control of the coordinator virtual device, the Office Action cites Frank, Fig. 4, element 16, col. 7, lines 21-37. Rather than equating the coordinator virtual device with a cluster as previously attempted, at this point the Office Action appears to be attempting to equate the coordinator virtual device of Applicants' claim 1 with the coordinator node 16 of Frank's Fig. 4. Aside from the above arguments concerning Frank's failure to teach or disclose a coordinator virtual device at all, coordinator node 16 is not a virtual device at all. Further, attempting to gain control of the coordinator node 16 is not performed when partitioning is detected in a computer system cluster. As stated in Frank, "[u]pon formation of the quorumless cluster 10, one of the member nodes 12, 14, 16, 18 is designated as the coordinator node" (Frank, col. 7, lines 21-23).

Regarding the claimed removing at least one of the plurality of nodes when attempting is unsuccessful, the Office Action states that this limitation is shown in Frank at col. 4 lines 32-34, col. 5, lines 1-5, and col. 6 lines 52-62.

Specifically, the cluster manager 32 manages cluster connectivity in the computer network cluster 10. For example, the cluster manager 32 can oversee the addition of nodes to and removal of nodes from the computer network cluster 10.

Frank, col. 4, lines 32-34.

As described above, the cluster manager 32 manages the cluster connectivity. One aspect of managing the connectivity of the cluster is monitoring the membership of the cluster.

Specifically, the cluster manager 32 manages cluster integrity when nodes are added to or removed from the cluster.

Frank, col. 5, lines 1-5

Moreover, as a network cluster operates, changes to the cluster definition may be made by a cluster administrator. These changes must be communicated to each node. In the case where a node is unavailable to the cluster for a period of time, changes to the definition are stored during the nodes period of unavailability. This often requires a log file to be maintained enumerating all changes to a cluster definition made while one or more nodes within a cluster are unavailable. As nodes may occasionally be removed from the cluster for maintenance, the log file could grow to a substantial size during the period of maintenance.

Frank, col. 6, lines 52-62

Unfortunately, it appears that the Office Action is equating the claimed coordinator virtual device with yet other aspects of Frank, i.e., the cluster manager 32 and the cluster administrator. Regardless, in the cited portions of Frank, unlike Applicants' claim 1, the cluster manager 32 oversees removal of nodes from the cluster without considering whether an attempt to gain control of the cluster manager 32 is unsuccessful. Likewise, the cluster administrator makes changes to the cluster definition without considering whether an attempt is unsuccessful to gain control of the cluster administrator.

Thus, for at least the above reasons, Applicants urge the Examiner to withdraw the 35 U.S.C. § 102(e) rejection of claim 1 as being anticipated by Frank.

Independent claim 28 contains generally the same limitations as described in relation to independent claim 1, and similar arguments apply for withdrawal of the 35 U.S.C. § 102(e) rejection of this claim.

Regarding independent claim 15, a system is recited that comprises:

a first data storage device;  
a virtual device configuration server coupled to the first storage device and including a first memory and a first processor configured to provide a coordinator virtual device corresponding to at least a portion of the first data storage device;  
a plurality of virtual device configuration clients configured as a computer system cluster, at least one of the plurality of virtual device configuration clients including a second memory and a second processor configured to:  
detect when the computer system cluster is partitioned;  
attempt to gain control of the coordinator virtual device corresponding to at least a portion of the first data storage device; and  
remove the at least one of the plurality of virtual device configuration clients from the computer system cluster when the attempt to gain control of the coordinator virtual device is unsuccessful.

Applicants respectfully submit that arguments similar to those made with respect to independent claim 1 apply to claim 15's claimed plurality of virtual device configuration clients configured to attempt to gain control of the coordinator virtual device, and to claim 15's claimed plurality of virtual device configuration clients configured to remove the at least one of the plurality of virtual device configuration clients when the attempt to gain control of the coordinator virtual device is unsuccessful.

Further, regarding other elements of independent claim 15, the Office Action states that the claimed "virtual device configuration server" is taught at Frank, col. 10, lines 63-67, which states:

For example, such a computer usable medium can include a readable memory device, such as a hard drive device, a CD-ROM, a DVD-ROM, or a computer diskette, having computer readable program code segments stored thereon.

Frank, col. 10, lines 63-67

Applicants respectfully request the Examiner to explain how Frank's description of an example "computer usable medium" supports the rejection of Applicants' virtual device

configuration server including a processor configured to provide a coordinator virtual device.

Among other things, the cited passage says nothing concerning a processor configured to provide a coordinator virtual device. Thus, for at least this reason, Applicants urge the Examiner to withdraw the 35 U.S.C. § 102(e) rejection of claim 15 as being anticipated by Frank.

As dependent claims 2-14, 16-27, and 29-31 add limitations to these otherwise allowable base claims, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(e) rejection to these claims as well.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5089.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on October 21, 2005.



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Date of Signature

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